

Testimony  
Of  
Elbert W (Joe) Friday, PhD  
On the  
National Oceanic and Atmospheric Agency Organic Act  
Before the  
Subcommittee on Environment, Technology, and Standards  
House Science Committee  
July 15, 2004

Mr. Chairman, members of the Subcommittee, my name is Elbert (Joe) Friday. I served in the National Weather Service (NWS) in the National Oceanic and Atmospheric Administration (NOAA) for 16 years, seven as Deputy and nine as its Director. I also served as the Director of the research arm of NOAA, the Office of Atmospheric and Oceanographic Research (OAR), for one year. Since retiring from NOAA, I have served as the Staff Director of the Board on Atmospheric Sciences and Climate of the National Academy of Sciences and as Professor of Applied Meteorology at the University of Oklahoma where I currently have an appointment as the Director of the Sasaki Applied Meteorology Research Institute. I wish to stress that this testimony represents my own views, based on my previous experience in NOAA and close associations with NOAA since my retirement from the Federal Government.

During these senior NOAA assignments, I have witnessed NOAA's strengths, which are many, and its weaknesses, which could seriously and negatively impact its vital missions and which need to be corrected. I offer the following responses to the questions posed to me in the letter of invitation.

### **Major Problems Facing NOAA**

#### Role Recognition

This may seem unusual to list as a problem, but NOAA's strength derives from the many national responsibilities that have been assigned to it. These national responsibilities include, but are not limited to:

The National Weather Service,

The National Ocean Service

The Nautical Charting mission

National Hurricane Center

The National Sea Grant College Program

The National Marine Fisheries Program

The Federal Coordinator for Meteorological Services and Supporting Research

And at least a dozen other national functions...

There has been a tendency in the past decade or so to try to change the philosophy of the NOAA organization to remove the term 'National' and substitute the term 'NOAA' in these organizational elements, a suggestion that inward

looking is more important than outward. While I can certainly recognize the need for an overall NOAA identity, this move fails to acknowledge the real constituent for the NOAA service. It is the Nation that needs these services, not NOAA. The focus of NOAA should be outward to the nation and its needs. An organic act could clearly define the national nature of the NOAA services.

#### Data Stewardship

Over the years, NOAA has failed to meet one of its major responsibilities: the stewardship of the nation's environmental data and information. NOAA's mission requires good science and information, whether in the areas of weather and climate forecasting, or in the areas of resource management. The activities conducted by NOAA affect the safety of all citizens and the economic condition of many of them as well as many businesses. These missions require quality data and information, and these data, once collected at taxpayers' expense, must be saved for future generations.

This is not to say that NOAA has not been making progress. Good people, dedicated to the mission, have tried to step up to the ever more daunting task, but they have fallen short. They have, fortunately, gone beyond the old situation used to describe NOAA's archival activities as a 'data hospice' where data go to die. But the full enormity of this mission has still not been formally recognized by NOAA, the Department of Commerce, (DOC) or the Office of Management and Budget (OMB). The volume of environmental data is growing at an ever faster rate with the addition of new and better systems of earth observations. The NEXRAD radars, the NPOESS and GOES satellite systems produce more data in one day than was formerly acquired in a year before the advent of these remote sensing systems that have contributed so much to our understanding of the earth. Additionally, these data, once collected, still need to be analyzed and improved. As new methods of data assimilation are developed, the archive needs to be reanalyzed to ensure the best information for studies of atmospheric and oceanic processes, of climate change and variability, and for input into research activities designed to improve weather and climate forecasting. As new algorithms are developed to process remote sensed data, the archived data need to be reprocessed using a consistent algorithm over the entire period of record. This will ensure the data continuity so necessary to the studies of climate change and variability. The present plans for the NOAA archival system do not include these vital components of a good data stewardship capability.

An Organic act could clearly identify the Nation's data stewardship as a NOAA responsibility, and the report documentation leading to that act could identify many of the characteristics of that stewardship that are needed.

#### NOAA Observing System Architecture

NOAA is moving in the direction of an overall architecture for observing systems. But here again, I do not believe the full enormity of the challenge is fully recognized in the funded plans. With respect to the satellite systems, the NPOESS program seems to be well under way to provide the polar orbiting

capabilities needed for the next two decades, but the GOES-R program needs attention to keep this nation from having the same type of gap in this vital satellite coverage that I experienced in the early 1990's when, due to development difficulties within the NASA procurement, the US was required to borrow a geostationary satellite from the European Union to guarantee Atlantic coverage during the hurricane season. In my opinion, this situation could recur, especially with the present uncertainties at NASA resulting in part by the elimination of the Earth Sciences Enterprise and the reorientation of NASA away from earth and toward exploration. I believe NOAA should seriously examine the possibility of conducting the GOES-R procurement itself rather than using NASA as has been done in the past.

An Organic act could clearly identify the Nation's earth observations as a NOAA responsibility, and the report documentation leading to that act could identify many of the characteristics of the supporting mechanisms that are needed.

#### NOAA Scientific Credibility

The recent attacks on the credibility of NOAA science have resulted, in my opinion, from a lack of understanding of the breadth and depth of NOAA science, and senior NOAA management's failure to articulate both the quality of the science as well as the critical necessity of retaining the scientific capability within NOAA.

During my 17 years in NOAA, its laboratory structure was absolutely critical to the very successful modernization of the NWS. The National Severe Storms Laboratory provided the research for the NEXRAD Doppler radar and its application. The Forecast Systems Laboratory provided the insight to interactive forecast techniques which became the cornerstone of the AWIPS system. The Geophysical Fluid Dynamics Laboratory provided the most significant improvement in hurricane forecasting that we had seen in two decades. The Pacific Marine Environmental Laboratory developed the ocean buoy technology which permitted the forecast of the 1997-1998 El Nino. The Environmental Technology Laboratory developed much of the technology that went into the Automated Surface Observing Systems. And the list could go on and on.

Presently, the National Severe Storms Laboratory is beginning to examine the next generation of weather radar that will be needed to replace the NEXRAD system, which is already over a decade and a half old. The Forecast Systems Laboratory is examining the next generation of weather forecasting models, and the Geophysical Fluid Dynamics is examining better science for improving the seasonal to inter-annual climate predictions. As NOAA adds air quality forecasting to its mission, the Air Resources Laboratory, the Aeronomy Laboratory, the Environmental Technology Laboratory and the Forecast Systems Laboratory are all working to bring the new operational capabilities to fruition.

With these demonstrated, vital connections between the NOAA research structure and the operations of one of the major NOAA line offices, NWS, it is incomprehensible to me that anyone could refer to NOAA's research as inconsequential and irrelevant to the NOAA mission.

Research success depends primarily on good people. It also depends on a suitable infrastructure to support the research. Planning needs to be in place in order to tie the future needs of NOAA to the emerging science. Lastly, and least important, is the precise organizational structure.

An Organic act could clearly identify the research in support of its mission as a NOAA responsibility, and the report documentation leading to that act could identify many of the characteristics of that research capability that are needed.

### **NOAA Missions and Functions**

The missions and functions are well defined in Section 103 of HR 4546. An organic act should establish broad parameters for an organization without unnecessarily restricting it as the situation in the science and constituent needs evolve over time. This bill, in my opinion, does an excellent job of establishing the generic mission and functions for NOAA, but goes beyond what I generally envision as an organic act in including what I view as implementation details. These details could more appropriately be included in separate authorization bills or in the report language that makes up the legislative history of the Bill.

### **The Proposed Reorganization under HR4546**

As mentioned in the comments under 'Research Credibility' above, people make an organization. The structure of an organization can interfere with the ability of the people to accomplish the mission of the organization. That being said, the three major components for NOAA as described in HR 4546, might be an effective structure, indeed the strategic planning efforts during the previous administration were along similar lines, but no reorganization of NOAA to match the planning structure was undertaken. One concern that I would with the organization as proposed relates to the wide disparity in size of the three major divisions, with the operations and services component dwarfing the other two. Special care would be required to ensure the appropriate linkage between the operational component and the research component. On the other hand, the organization might support better integration across the existing line office structure.

### **Deputy Assistant Secretary for Science and Technology**

The creation of the position of Deputy Assistant Secretary (DAS) for Science and Technology (S&T) could be, in my opinion, a positive step to strengthen the role of science within NOAA. The creation of the Chief Scientist of NOAA in the mid-1980s never resulted in the sort of science leadership that NOAA needs and deserves. Previous Chief Scientists were political appointees, many having a

single issue focus and were not interested in the broader NOAA science issues. This bill creates the DAS for S&T as a 'career reserve' Senior Executive Service position and requires that it be filled by someone of considerable scientific stature, a most appropriate requirement for an agency whose service depends on scientific excellence. The requirement for consultation with the National Academies of Sciences to ensure scientific stature is a good one. Indeed, that practice is followed now by some science based agencies and historically was used during the first half of the last century in the selection of the Chief of the US Weather Bureau, the predecessor organization to the NWS.

The DAS for S&T also should be responsible for the oversight of major science programs in NOAA, including the National Sea Grant College Program, the US Weather Research Program, the Coastal Ocean Program, etc.

### **Additional Specific Comments on HR 4546 as Written**

HR 4546 provides a potential structure which, if enacted, could set a framework that could help correct many of NOAA's problems. I would make the following comments on the bill as written. Many of these sections might more appropriately be structured outside of the NOAA Organic Act itself, either in authorization language, or in report language, but these comments are provided to the content of the bill as written.

- The inclusion of the solar and geophysical events on the sun and in the space environment in the NOAA mission is appropriate. It reflects the growing importance of this science as the society becomes more dependent on satellite systems and sensitive electronics that are especially vulnerable to the solar emissions and geomagnetic storms that we refer to as 'space weather.'
- The codification of the NOAA responsibility for coordinating the national and international programs in meteorological services and supporting research is important. The Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM), currently located in NOAA, has had this responsibility since the mid 1950s, but only operated under an Office of Management and Budget Circular (A-62) which was formally rescinded in the mid 1980s. Although the OFCM has continued to operate relatively effectively, this bill can provide the emphasis to strengthen the coordination process.
- Sect 103(c) (11) should also include weather and climate activities as well. The World Meteorological Organization (WMO), a specialized agency of the United Nations, is charged with the international coordination of these activities and NOAA, usually through the Director of the NWS, provides the Permanent Representative to the WMO for the Department of State.

- Section 105 The NWS. This is a good organic act for the NWS, outlining the general mission and responsibilities of the organization and acknowledging the importance of the private sector to the overall weather and climate enterprise.
- The term 'space weather' needs to be added explicitly to the NWS mission. It is already included in the sections on goals and functions.
- The 'Partnerships' section needs to be expanded to include the academic sector of the weather and climate enterprise in addition to the public and private sectors. This enterprise is increasingly dependent upon a strong private sector, a strong public sector and a strong academic community. I fully endorse the recent report of the National Research Council: "Fair Weather – Effective Partnerships in the Provision of Weather and Climate Services."
- Section 106, Operations and Services. Under function 5, add 'reprocessing' and 'reanalysis' so as to read: ..."data processing, storage, reanalysis, reprocessing and archive activities"... As the science of data assimilation improves, it is necessary to go back and reanalyze the archived data to ensure a quality data set that can be used to identify trends for climate trends and variability studies. Similarly, as the satellite remote sensing algorithms are improved, the archived satellite data must be reprocessed using the latest algorithms to provide continuity for climate change and variability studies.
- The Science Advisory Board (SAB). The existing SAB has had mixed results. Originally, the SAB was to be modeled after the National Science Foundation's National Science Board. This was an admirable goal that soon became distorted into a body that had much more of a tendency to 'rubber stamp' the Administrator's desires than to seriously examine NOAA's science issues. I would recommend that the members of the SAB be appointed with the consultation of the National Academy of Sciences, similarly to the DAS for S&T. The present process of appointing working groups under the SAB can circumvent the objective measures the FACA process brings to the creation of advisory bodies. The science of NOAA is critical to the well being of every citizen of the United States, indeed, in some cases the entire world. NOAA deserves the best objective science advice it can obtain.
- Section 109, Reports. The two reports required under section 109 cover materials vital to the health of NOAA Science and therefore NOAA service.

For much too long, NOAA has not fully stepped up to its responsibility for data stewardship. The volume of data that describes the environment is increasing at a rate that can

cause a complete collapse of the NOAA data stewardship capabilities unless careful, realistic planning is undertaken in the very near term, and that plan appropriately resourced.

One additional item should be added under section 109 (a) (1):

“f. Reanalyze and reprocess the archived data as better science is developed to integrate diverse data sources and better algorithms are developed to convert remote sensed information into geophysical parameters. These tasks are required to ensure data continuity for studies of climate variability and change.”

In section 109 (a) (2) (c), include ‘reanalysis and reprocessing’ in the list of responsibilities.

The Strategic Plan for Scientific Research is also badly needed in NOAA. For much too long the strategic planning process has downplayed research, with the resulting erosion of the NOAA research base and the increasing tendency to sacrifice research for pressing operational needs. This practice is equivalent to ‘eating your seed corn’ during rough times, a practice that will guarantee future starvation. As in the analogy, stopping research today will starve the services of tomorrow.

Given the importance of both these reports, they must be complete and objective. In my 17 years in NOAA, I saw frequent reports presented to Congress with unusually strong ‘spin’. NOAA is to be commended for using the National Academy of Sciences to review the recent Climate Change Science Plan. I would recommend that these reports be reviewed by either the SAB, or the National Academy of Sciences, preferably the latter, to minimize any potential for questions of credibility.

### **Comments on HR 4607**

HR 4607, submitted to the Congress by NOAA is more along the line of a (very sparse) organic act. This was generated in response to the Ocean Commission report and NOAA should be commended for its rapid response. It provides little guidance on the organizational structure and the covers only the highest level of functions. Although I believe that HR 4546 goes too far in specifying what I would view as implementation activities, I expect the final NOAA Organic Act will lie somewhere between these two bills.

In conclusion, Mr. Chairman, I believe that NOAA is an organization that is critical to the success of our nation. Your interest in making sure the NOAA mission can be accomplished effectively is appreciated. I thank you for the opportunity to play a small part in the deliberations on this important legislative initiative.